

# **System and method for product display, arrangement and rotation**

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## **RELATED APPLICATION**

5           This is a continuation-in-part application for U.S. Patent Application Number 09/918,843 which was filed on July 31, 2001. Application number 09/918,843 was related to provisional patent application No. 60/290969 filed on May 14, 2001 and to provisional patent application No. 60/292441 filed on May 19, 2001.

## **10   BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

          The invention relates to the display, arrangement and rotation of products such as those packaged in bottles, jars, cans, and boxes, and more particularly to an improved product display, arrangement and rotation system and method in which products  
15       displayed on a display shelf can easily be arranged or rotated to have the products' expiration dates kept safely up to date and to conveniently position the products manually near the front edge of the shelves for improved visual exposure and effortless selection by consumers.

### **2. Description of Related Art**

20       Retail stores relying on the consumers to serve themselves have recognized the importance of displaying products near the front edge of display shelves so that the products can be readily seen by consumers and easily reached by the consumers. Customers typically remove products from the front of a display shelf, and products remaining toward the rear of display shelves are often difficult to reach.

Well operated retail stores have clerks move around the store periodically to check the status of goods and to make appropriate corrections by moving products toward the front of display shelves. There is a need to make this alignment process more efficient.

It is also desirable to properly rotate products on a display shelf so that the older products are sold before the newer products. A system for the easy rotation of products is needed to decrease the likelihood that a product will have to be discarded after reaching its expiration date.

The prior art provides some examples of automated or semi-automated shelf display alignment.

U.S. Pat. No. 6,155,438 to applicant describes a system and method for product display, arrangement and rotation. That patent includes a relatively fixed side frame which is typically held in place by magnetic attraction, and a pull frame attached to a rear member that is used to pull product forward on a shelf. That invention is appropriate for containers with straight side walls such as boxes and cans. The current invention is well-suited for containers such as bottles and jars with rounded, or otherwise non-linear side wall profiles.

The '438 patent discusses prior art including U.S. Pat. No. 5,203,463 to Steven K. Gold which teaches the use of springs to push items to the front position on the display shelf; U.S. Pat. No. 5,240,126 to Foster which also uses a ribbon spring arrangement to advance a row of items forward; U.S. Pat. No. 5,240,125 to Kunz, which is similar to the '126 patent, with the addition of a protective wire grid to prevent a glass jar from falling out of the device; and U.S. Pat. No. 5,123,546 to Crum which also uses a spring mechanism.

## BRIEF SUMMARY OF THE INVENTION

The invention relates to a device, system and method for displaying and rotating products generally forming a queue on a display surface such as a display shelf.

Some embodiments include two slide rails, one slide rail positioned on either side of a row of product containers. The containers are typically bottles or jars with rounded bottom sides. The slide rails preferably fit within the vacant space left by the rounded lower portion of a row of containers, or within the vacant space left by the lower portions of adjacent rows of containers so as not to take up valuable shelf space. The slide rails are connected to a rear element so that when the slide rails are pulled outward from the display shelf, the rear element engages the queue and pulls the remaining containers toward the front of the display shelf. A front pull element preferably connects the first slide rail with the second slide rail so that the two slide rails may be pulled at the same time and rate by pulling the front pull element.

In one embodiment, the slide rails, the front pull element, and the rear element are formed as a single wire frame. In other embodiments, a plate may serve as the rear element; a cover such as plastic tubing may be placed over the slide rails in order to increase the size of the slide rails in order to help stabilize the product containers; the device may be formed as a single unit, such as by injection molding; or the width between the slide rails may be adjusted.

In some embodiments according to the invention, the slide rail element includes indicia identifying the number of the products in the queue when the positioning element is moved so that the products are substantially aligned with the front portion of the surface. The indicia may also contain information corresponding to the products in the queue. Additionally, the indicia may be a bar code.

Another embodiment according to the invention comprises a temporary shelf basket for receiving products from the surface of the shelf to facilitate the rotation of older products from the rear portion of the surface to the front portion and newer products to the rear portion of the surface. The shelf basket is temporarily attached to the display shelf, preferably by inserting

5 basket support arms into holes located on the display shelf.

A method is provided to use the shelf basket for product rotation by temporarily attaching the basket to the display shelf; removing old product from a row of product display; determining the number of new containers necessary to fill the row; placing the proper number of new containers in the row; removing the old product from the basket and placing the old products in front of the  
10 new products in order to fill the row; and removing the shelf basket from the display row.

Another method according to the invention is a method for arranging and displaying products generally forming a queue and taking an inventory, comprising the steps of providing a shelf generally for receiving products to be displayed and having a front and rear portion; providing products having front and rear sides for arrangement and display on the shelf generally  
15 in a queue having a front and rear product; and providing an arranging means for placement on the shelf. The arranging means comprises a pair of slide rails, the slide rails defining a channel for receiving the products. The arranging means further has a rear element adapted to engage the rear product in the queue from the rear side of the product, thereby allowing the rear product to be engaged by the rear element for movement from a position in the rear portion to a  
20 predetermined position closer to the front portion of the surface. The method further comprises positioning the products in the channel generally in the form of a queue; selectively moving the products manually from the rear portion of the shelf towards the front portion of the shelf by

applying a force to the slide rails generally in a direction of the front portion of the shelf, thereby engaging the rear product with the rear element until the first product is located at a predetermined position near the front portion of the shelf; reading the indicia to determine the number of products remaining in the queue; and finally, returning the device to its original position by applying a force on the slide rails generally in a direction of the rear portion of the shelf until the device reaches its original position.

Another embodiment incorporates a product support base with raised tabs to support a row of product containers and to permit the slide rails to slide underneath product containers.

#### 10 BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1A is a perspective view of a wire frame embodiment of the invention with slip-on tubing covers.

FIG. 1B is a perspective of a slip-on split tubing cover of the embodiment shown in FIG. 1A.

FIG. 1C is a cross sectional view towards the rear element of the embodiment shown in FIG. 1A showing an adjustable width feature of the embodiment.

FIG. 1D is a cross sectional view towards the front pull element of the embodiment shown in FIG. 1A showing an adjustable width feature of the embodiment.

FIG. 1E is a front view of a portion of a display shelf showing product containers and several devices of the embodiment shown in FIG. 1A.

FIG. 1F is a perspective view of a device of the embodiment shown in FIG. 1A used to align containers on a display shelf.

FIG. 2A is an exploded perspective view of an alternative wire frame embodiment of the

invention with slip-on tubing covers.

FIG. 2B is a perspective view of the alternative wire frame embodiment of FIG. 2A with tubing covers inserted over the side rails.

FIG. 2C is a perspective view of the alternative wire frame embodiment of FIG. 2B with a rear element installed.

FIG. 3 is a perspective view of an alternative wire frame embodiment without a rear plate element.

FIG. 4A is an exploded perspective view of another wire frame embodiment of the invention.

FIG. 4B is a cross sectional view of an alternate rear member with side rail receiving channels.

FIG. 4C is a perspective view of the embodiment of Fig 4A positioned on a display shelf for proper length sizing.

FIG. 4D is a perspective view of the embodiment of Fig 4A positioned on a display shelf with the rear element being bent to size the length of the device.

FIG. 4E is a perspective view of a portion of a display shelf showing product containers and several devices of the embodiment shown in FIG. 4A.

FIG. 4F is a perspective view of a portion of a display shelf showing stacked product containers being aligned with devices of the embodiment shown in FIG. 4A. FIG. 4G is a front view of a portion of product containers on a shelf.

FIG. 5A is a front view of a portion of product containers on a shelf.

FIG. 5B is a front view of a portion of product containers on a shelf illustrating the vacant space at the base of the containers.

FIG. 6A is an exploded perspective view of another embodiment of the invention.

FIG. 6B is a perspective view of the embodiment of Fig 6A positioned on a display shelf with product containers.

FIG. 6C is a perspective view of another cover for the embodiment of Fig 6A.

FIG. 6D is a perspective view of the embodiment of Fig 6c with the width of the device narrowed by bending the rear element and the front pull element.

FIG. 7A is a perspective view of an embodiment having unconnected bent wire as the rear member.

FIG. 7B is a perspective view of an embodiment having welded wires as the rear member.

FIG. 8 is a perspective view of an embodiment with molded or extruded elements.

FIG. 9 is a top view of several devices in position on a display shelf illustrating the use of the device in aligning product containers.

FIG. 10A is a perspective view of an accessory rear element for stacked containers.

FIG. 10B is a perspective view of the embodiment of Fig 10A showing stacked containers.

FIG. 10C is a side view of stacked containers with the rear element of FIG. 10A.

FIG. 11A is a perspective view of a basket to assist in restocking for product rotation.

FIG. 11B is a perspective view of a basket positioned on a display shelf.

FIG. 12A is a perspective bottom view of a container base to inhibit container rotation.

FIG. 12B is a side view of devices of FIG12A attached to the bottoms of containers.

FIG. 12C is a bottom view of a container base of FIG. 12A.

FIG. 12D is a bottom view of a container base with a rectangular base.

FIG. 13A is a perspective view of a divider base unit.

FIG. 13B is an exploded side view of several adjacent divider base units.

FIG. 13C is a side view of adjacent divider base units with can containers.

FIG. 13D is a perspective view of an alignment device placed on a divider base unit.

FIG. 13E is a side view of adjacent divider base units with can containers.

FIG. 14A is an exploded top perspective view of a two piece wire frame assembly.

5 FIG. 14B is a top perspective view of an assembled frame of the embodiment of FIG. 14A.

FIG. 15A is a top view of a frame with a coupling device.

FIG. 15B is a top view of an embodiment with a coupling device accepting two overlapping side rail portions.

FIG. 16A is a top perspective view of a frame with an adjustable rear pull plate member.

10 FIG. 16B is a top perspective view of the embodiment of FIG. 16A showing a removing of the rear pull plate element.

FIG. 16C is a top perspective exploded view of the pull member of FIG. 16A.

FIG. 16D is a top perspective view of the pull member of FIG. 16A before the rear member is bent upwards.

15 FIG. 17A is a side perspective view of a cut and inverted display carton.

FIG. 17B is a side perspective view of the carton of FIG. 17A with the bottom portion removed and wire frames inserted over the bottoms of rows of product containers

FIG. 17C is a side perspective view of the carton of FIG. 17A with the front bottom portion of the carton removed.

20 FIG. 17C is a side perspective view of the carton of FIG. 17A with the carton re-inverted and the top portion removed.

FIG. 18A is a front perspective view of a pull device with adjustable bend couplers.



FIG. 18B is a perspective view of an adjustable bend coupler of FIG. 18A.

FIG. 19 is a front perspective view of an embodiment with a multiple row front stop device.

FIG. 20A is a front perspective view of an embodiment with snap on front stop devices.

FIG. 20B is a side view of the embodiment of FIG. 20A.

5 FIG. 20C is a front perspective view of a front stop device with pull slot and anchor features.

FIG. 20D is a front perspective view of the front stop device of FIG. 20C with pull slide.

FIG. 21A is a front perspective view of an embodiment with a container support and a pull device with a generally rectangular front pull shape.

FIG. 21B is a front view of the embodiment of FIG. 21A.

10 FIG. 21C is a front perspective view of an unaligned row of the embodiment of FIG. 21A.

FIG. 21D is a front perspective view of an aligned row of the embodiment of FIG. 21A.

FIG. 21E is a front perspective view of several rows of the embodiment of FIG. 21A.

FIG. 21F is a front perspective view of several rows of the embodiment of FIG. 21A.

FIG. 22A is a top view of an unbent alignment device.

15 FIG. 22B is a side view of the alignment device of FIG. 20A bent to a first length.

FIG. 22C is a side view of the alignment device of FIG. 20A bent to a second length.

FIG. 22D is a side view of the alignment device of FIG. 20A bent to a third length.

FIG. 23 is a front perspective view of an embodiment with a container support and a pull device with a generally triangular front pull shape.

20 FIG. 24A is a top perspective view of a closed loop wire frame.

FIG. 24B is a top perspective view of the embodiment of FIG. 24A showing a narrowing of the width.

FIG. 24C is a front view of the embodiment of FIG. 24A.

FIG. 24D is a side view of the embodiment of FIG. 24A.

FIG 25A is a front perspective view of an alternative embodiment of single or multiple row stop devices.

5 FIG 25B is a front perspective detailed view of a front stop holder of FIG. 25A.

FIG 25C is a side view of the holder of FIG. 25B secured to the lip of a display shelf.

## DETAILED DESCRIPTION OF THE INVENTION

### DETAILED DESCRIPTION OF EMBODIMENT – Wire frame with slit side rail covers

10 Referring now to Fig 1A, an embodiment of the current invention is a product display aligning device **10** which is comprised of a wire frame featuring a first side rail **11**, a second slide rail **12**, a rear pull element **30** affixed to the first and second side rails, and a front pull member **20**.

Referring now to Fig 1B which is a perspective of a slip-on split tubing cover of the  
15 embodiment shown in FIG. 1A, the side rails may be covered with a material such as a round slit plastic tubing **14**, or they may be left uncovered. In this example, the slit tubing is positioned over each side rail. In other embodiments, the side rail coverings may be installed by other techniques, such as slipping the cover onto the side rail before bending the side rail, or they may be fabricated as a single element without a wire support. The covers may be of various shapes  
20 and sizes in order to best fit a particular use as discussed below. In this embodiment, the term slide rail refers to a covered side rail if a cover is installed, and to an uncovered side rail if a cover is not installed prior to use.

Referring now to Fig 1C which is a cross sectional view towards the rear element of the

embodiment shown in FIG. 1A, a rear plate 30 is affixed to the side rails 11 and 12 by means of

welds 31. Other means of attachment such as positioning the side rails in retaining tabs or

channels on the rear element may also be used. One function of the rear element is to engage

product containers in order to align those containers on a display shelf. In other embodiments,

5 another function of the rear element is to provide a surface for affixing a label associated with the

display product. The rear element may be of various shapes, and in some instances may simply

be a bent portion of one or both slide rails. In this embodiment, the side rails 11 and 12 may be

bent relative to the rear element in order to narrow or enlarge the distance between the slide rails.

For example, the first side rail 11 may be bent to a narrowing position 111, and the second side

10 rail 12 may be bent to a narrowing position 112. This width adjustment feature is useful for

adapting the device to various sizes of container bases.

Referring now to Fig 1D which is a cross sectional view towards the front pull element of

the embodiment shown in FIG. 1A, in this embodiment, the side rails 11 and 12 are formed from

a continuous heavy wire. For example, the wire may be a stainless steel such as 1/8" or thicker

15 wire. The wire may simply be bent in the plane of the slide rails to form a box end, but the wire

is typically bent upwards in the form of an inverted "V" in order not to interfere with the

visibility of display shelf labeling. In this embodiment, the front pull element may be bent to

narrow or enlarge the distance between the side rails as illustrated by a second narrowing

position 120.

20 Referring now to Fig 1E which is a front view of a portion of a display shelf 50 showing

product containers 90 and several devices of the embodiment shown in FIG. 1A, the adjacent

product containers and alignment devices may be similar as illustrated in this figure, or the

devices may be adapted to various shapes and sizes of containers so that the geometry of adjacent devices may be different.

Referring now to Fig 1F which is a perspective view of a device of the embodiment shown in FIG. 1A used to align containers on a display shelf, a clerk's hand **200** may grasp the front pull element **20** and thereby pull the slide rails **40** and **41** away from the rear of the display shelf. The rear element will engage the rearmost product container **91** and pull the container toward the front of the shelf. The clerk would typically continue pulling until the forward-most product container is properly aligned with the front of the display shelf, and would then push the front pull element back to its original position at the edge of the display shelf.

#### DETAILED DESCRIPTION OF EMBODIMENT – Wire frame inserted in rail covers

Referring now to Fig 2A, another embodiment of the current invention is a product display aligning device which is comprised of a wire frame **9** featuring a first side rail **11**, a second slide rail **12**, and a front pull member **20**. In this embodiment, a rear element is not installed until after slide covers **15** are inserted over the side rails.

Referring now to Fig 2B which is a perspective view of the alternative wire frame embodiment of FIG. 2A with tubing covers inserted over the side rails, the side rails are partially covered with a material such as a round plastic tubing **15**. The covers may be of various shapes and sizes in order to best fit a particular use as discussed below.

Referring now to Fig 2C which is a perspective view of the alternative wire frame embodiment of FIG. 2B with a rear element installed, a rear element **30** is welded or otherwise attached to the side rails. The covered side rails serve as slide rails **40** and **41**.

## DETAILED DESCRIPTION OF EMBODIMENT – Wire rear member

Referring now to Fig 3, another embodiment of the current invention is a product display aligning device which is comprised of a wire frame featuring a first slide rail **40**, a second slide rail **41**, a front pull member **20**, and a bent rear member **32**. In this embodiment, the rear element function is provided by the bent wire of the side rails. The wire may be welded or otherwise coupled at any point in the frame, but preferably the wire is either jointed at the bent rear member or in a position along the side rails that is covered. Alternatively, the wire may be left uncoupled, and the cover may serve to hold the wire in proper alignment. In another embodiment, the front pull section **20** and the bent rear member may be two different pieces of wire that are held in position by the side rail covers, so that the front and rear sections are inserted into the covers.

## DETAILED DESCRIPTION OF EMBODIMENT – Adjustable frame length

Referring now to Fig 4A, which is an exploded perspective view of another wire frame embodiment of the invention, the wire frame **9** is bent to form the two side rails **11** and **12**, and the front pull member **20**. The back ends of the side rails are left straight and unattached. A rear member **33** is slipped onto the side rails. The rear member may have a label **35** or other identifying information affixed or printed on it.

Referring now to Fig 4B, which is a cross sectional view of an alternate rear member with rail channels, the rear member **33** has a first side rail receiving channel **34a** and a second side rail receiving channel **34b** to accept the side rails. This embodiment is particularly useful for specialty items such as baby food.

Referring now to Fig 4C, which is a perspective view of the embodiment of Fig 4A

positioned on a display shelf for proper length sizing, the device may be sized for proper length on a display shelf by placing the wire frame 9 with the front pull section positioned at the rear of the shelf 50. The side rails 11 and 12 will then overhang the front edge of the display shelf. The rear member 33 is placed on the side rails by inserting each side rail in a side rail receiving channel located on the rear member.

Referring now to Fig 4D which is a perspective view of the embodiment of Fig 4A positioned on a display shelf with the rear element being bent to size the length of the device, the rear member may be bent upwards to a second position 133 in order to size the device for the shelf. Optionally, covers may be placed on the side rails before bending the side rails, or slit covers may be placed on the side rails after bending. For smaller product containers, the side rails may serve as slide rails without covers.

Referring now to Fig 4E which is a perspective view of a portion of a display shelf showing product containers and several devices of the embodiment shown in FIG. 4A, the devices are positioned so that the rear elements 33 are at the rear of the display shelf 50. In the case of small containers 91 such as baby food jars, the containers may be stacked.

Referring now to Fig 4F which is a perspective view of a portion of a display shelf 50 showing stacked product containers being aligned with devices of the embodiment shown in FIG. 4A, a clerk's hand 200 may grasp the front pull element 20 and pull the slide rails away from the rear of the display shelf. The rear element 33 will engage the rearmost product containers 91 and pull the containers toward the front of the shelf. The clerk would typically continue pulling until the forward-most product container is properly aligned with the front of the display shelf, and would then push the front pull element back to its original position at the edge of the display

shelf.

Referring now to Fig 4G which is a front view of a portion of product containers on a display shelf **50**, the side rails **11** and **12** fit in the spaces created by the rounded bottoms of the containers **91** so that the devices can be installed without requiring additional shelf width.

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#### DETAILED DESCRIPTION OF EMBODIMENT – Various Slide rail shapes and sizes

Referring now to FIG. 5A which is a front view of a portion of product containers **92** on a shelf **50**, the figure illustrates that various shapes of slide rails may be used fit in the vacant spaces created by the bottom portions of the product containers. The slide rails may be round **15**,  
 10 or polygonal such as the rectangular **16** or generally triangular **17** elements as shown. The slide rails may be of single piece construction such as plastic extrusions, or they may be in the form of covers which are positioned on a wire frame.

Referring now to FIG. 5B which is a front view of a portion of product containers on a shelf illustrating the vacant space at the base of the containers, the widest part of the containers  
 15 **92** is shown as point **43** along the side wall of the containers. The base of the containers is shown as **44**. The area between the lower portion of the side wall **47** and a line **46** tangent to the widest point **43** of the container and perpendicular to the display shelf **50** defines a vacant cross sectional area for the preferred positioning of the slide rails. Depending upon the height and mass of the container, it is desirable to select a slide rail geometry and size that will fit  
 20 substantially within the vacant space so as not to take up additional shelf width, but which will also assist in stabilizing the containers when they are moved.

The slide rails may include markings or indicia for indicating the number of products in the queue, or the number of products necessary to fill a queue.

#### DETAILED DESCRIPTION OF EMBODIMENT – Extruded slide rails

Referring now to FIG. 6A which is an exploded perspective view of another embodiment of the invention, the slide rails may be extruded, or otherwise fabricated, such as the generally  
5 triangular sections **17** shown, and the front pull section **21** and the rear member may be insertable into the slide rails.

Referring now to FIG. 6B which is a perspective view of the embodiment of Fig 6A positioned on a display shelf **50** with product containers **92**, the slide rails **40** and **41** are the extruded sections, and the rear member **35** and the front pull member **21** have been inserted into  
10 the slide rails.

Referring now to FIG. 6C which is a perspective view of another cover for the invention of Fig 6A, the front pull element **21** and the rear element **35** are inserted into round covers **15**.

Referring now to FIG. 6D which is a perspective view of the embodiment of Fig 6C, the width of the device may be narrowed by bending the rear element **35** and the front pull element  
15 **21**. In this manner, the device may be adapted to various sizes of containers.

#### DETAILED DESCRIPTION OF EMBODIMENT – Bent wire rear member

Referring now to FIG. 7A which is a perspective view of an embodiment having unconnected bent wire as the rear member, the side rails **11** and **12** may be bent inward to  
20 function as a rear member without a plate or other connecting device.

Referring now to FIG. 7B which is a perspective view of an embodiment having welded wires as the rear member, one or more wire elements **36** may be welded or otherwise secured to the side rails **11** and **12** in order to hold the side rails in position and to form a rear member.



## DETAILED DESCRIPTION OF EMBODIMENT – Extruded unit

Referring now to FIG. 8 which is a perspective view of an embodiment with molded or extruded elements, the entire arranging unit **10** may be produced by injection molding. This technique is useful for common slide rail sizes and shelf widths. Alternately, the slide rails **40** and **41**, the rear element plate **37**, and the front pull element **22** may be molded separately and assembled; the slide rails and front pull element may be formed as a first unit and then attached to a rear element plate; or the slide rails and rear element plate may be formed as a first unit and then attached to a front pull element.

## 10 DETAILED DESCRIPTION OF EMBODIMENT – Alignment method

Referring now to FIG. 9 which is a top view of several devices in position on a display shelf, reference **201** shows a first size of device with no products in the row; reference **202** shows a second size of device with no products in the row; reference **203** shows the first size of device with products **94** properly displayed toward the front of the display shelf; reference **204** shows the second size of device with products **93** remaining toward the rear of the display and with empty shelf space in front of the products where products have been removed; reference **205** shows a clerks hand **200** having pulled the device to align the products of element **204** toward the front of the display shelf; and reference **206** shows a clerks hand **200** having pushed the device back into position after aligning the products toward the front of the display shelf.

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## DETAILED DESCRIPTION OF EMBODIMENT – Rear element for stackable containers

Referring now to FIG. 10A which is a perspective view of an accessory rear element for

stacked containers, the rear element **38** is designed to fit between the channel between the first slide rail and the second slide rail in order to support stacked containers. In this example, the rear element is comprised of a rear support **381**, side supports **382**, a base **384**, and a front lip **383**.

5 Referring now to FIG. 10B which is a perspective view of the embodiment of Fig 10A showing stacked containers **91**, the rear element supports the rearmost stack of containers as the stack is moved into alignment. Once the containers are aligned, the front pull member may be pushed back into position, and the accessory rear element will remain with the rear product stack in the row. The accessory rear element supports a stacked row as it is moved into alignment.

10 Referring now to FIG. 10C which is a side view of stacked containers with the rear element of FIG. 10A, a clerk's hand **200** may grasp the pull unit to engage the rear support **381** in order to pull the stacks of containers **91** forward.

#### DETAILED DESCRIPTION OF EMBODIMENT – product support basket

15 Referring now to FIG. 11A which is a perspective view of a basket to assist in restocking for product rotation, the basket **400** is designed with support arms **401** which can be inserted into holes in the display shelf in order to support the basket and its contents. The support arms each preferably include a bend **402** which engages a hole in the display shelf. The display shelf is typically perforated on the front edge with a plurality of holes. The basket is typically of welded  
20 wire construction.

Referring now to FIG. 11B which is a perspective view of a basket positioned on a display shelf, the basket **400** has been positioned adjacent to a row of product containers **92**. The

basket is held in place by inserting the support arms into holes **51** on the display shelf **50**. The basket is typically used to hold product containers from a shelf while new containers are placed in the rear of the row according to proper rotation. For example, the product row illustrated has 4 containers, and a full row would hold 9 containers. The four containers may be removed by  
5 pulling the front pull element and bringing the product containers to the front of the shelf. The four containers would be placed in the basket, and five new containers would be inserted in the row by placing a container at the front of the row and pushing it backwards toward the rear of the shelf. The slide rails **40** and **41** help to align the product as it is being pushed backward. After the five new containers are placed in the row, the four old containers are removed from the  
10 basket and placed in the row in front of the new containers. The entire row can be aligned, if necessary, by pulling the pull element.

#### DETAILED DESCRIPTION OF EMBODIMENT –Rotational alignment base

Referring now to FIG. 12A which is a perspective bottom view of a device to inhibit  
15 container rotation, a product container may be formed with a polygonal base **500** which can inhibit rotation of the container when the container is placed in a display alignment device. The side walls of the polygonal base are preferably in or near contact with the slide rails, and the slide rails prevent the product base **500** from rotating when the slide rails are pulled forward.

Referring now to FIG. 12B which is a side view of devices of FIG12A attached to the  
20 bottoms of containers, the base **500** is positioned between the slide rails **40** and **41** in order to prevent the container from rotating as it is moved on the display shelf.

Referring now to FIG. 12C which is a bottom view of a container base of FIG. 12A, the

base 500 fits between the slide rails 40 and 41. The base may either be touching the slide rails, or there may be a gap between the base and the slide rails.

Referring now to FIG. 12D which is a bottom view of a container base with a rectangular base 501, the base may be rectangular.

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#### DETAILED DESCRIPTION OF EMBODIMENT –Divider support base

Referring now to FIG. 13A which is a perspective view of a divider base unit, it is desirable with some products such as soup cans, to provide a product alignment means which can align product on a display shelf without taking additional shelf width. Containers such as soup  
 10 cans, toppings, and Vienna sausages are well-suited to this embodiment. Soup cans, for instance, typically have a .005 inch thick rim at the top of the cans for the purpose of stabilizing a stack of cans. A base unit 600 as illustrated in FIG. 13A is designed to fit within the small gap between the bottom portions of adjacent rows of cans. The unit includes a vertical lip 602 that serves as a divider between rows of containers.

15 Referring now to FIG. 13B which is an exploded side view of several adjacent divider base units, another rib 608 is preferably located so that the first rib 603 of a second base unit can fit over the rib to create a channel for a particular size container.

Referring now to FIG. 13C which is an is a side view of adjacent divider base units with can containers, the stacking of base units may continue for as many rows as desired, and an end  
 20 unit 620 may be placed as a last unit to form the last channel.

Referring now to FIG. 13D which is a perspective view of an alignment device placed on a divider base unit, ribs 603 and 604, which are typically 5/32" high, support the containers

above flat areas of the base **605**, **606**, and **607**. A product alignment device, such as a 1/8" wire pull frame can be positioned on the flat areas **605** and **607**, so that the slide rails **40** and **41** may move on those surfaces underneath the containers positioned on the ribs **603** and **604**.

Referring now to FIG. 13E which is a side view of adjacent divider base units with can containers, the can containers **95** may be placed in the channels formed by the base units. The front pull member **21** of the alignment device can be used to align the products to the front of the display shelf.

#### DETAILED DESCRIPTION OF EMBODIMENT - Closed adjustable wire frame

In this embodiment, a closed wire frame **8** is provided as shown in FIG. 24. The frame includes a first side rail **11**, a second side rail **12**, a front portion **20** and a rear portion **32**. In this example, the front portion and the back portion are symmetric. In other examples, the front and rear portions may be non-symmetric. Examples of non-symmetry include making the front section lower than the side rails, or making the rear section taller than the front section.

In this example, the front portion has a front bend **710**, and the rear portion has a rear bend **720**, so that the distance between the side rails may be increased or decreased by bending the front and rear portions along the front bend **710** and rear bend **720**.

In this example, there are four additional bends in the frame including a first side front bend **711**, a second side front bend **712**, a first side rear bend **721**, and a second side rear bend **722**. In one manufacturing process, the six bends are provided on a single piece of wire, and the ends of the wire are welded together. Automatic Specialties Co. of Marlboro, Massachusetts may fabricate a frame of this type according to customer specifications.

This frame may be fabricated so that the length of the side rails **11** and **12** corresponds to

a display shelf depth. Commonly, display shelves have depths ranging from 18-24 inches. The product may also be provided with various lengths of front and rear portions in order to permit adjustment of frame width to match desired display products. The wire frame may be positioned adjacent to display items where the lower portions are contoured, so as to not take up additional shelf space.

The frame may be adjusted as previously discussed by bending the device along the front bend **710** and rear bend **720** in order to increase or decrease the distance between and first and second side rails.

In one embodiment for cans having a bottom diameter ranging from about 1 1/2 inches to about 3 inches, the front and rear portions may be provided in a length of about 6 inches. As this frame width is adjusted, any distance between the side rails may be selected in the range of about 1 1/2 to 3 inches. FIG. 24B illustrates a narrowing of the width between the first side rail **11** and the second side rail **12** by decreasing the front bend **710** angle and decreasing the rear bend **720** angle.

In some applications, it is desirable to provide a size of frame so that the apex of the front bend is within a range of about 1 inch to 3 inches above the display shelf. This range permits a person to easily grab and hold the front portion, without making the front portion too tall where it could obstruct a merchandise item.

In other embodiments, the frame may be fabricated from two or more pieces of wire that are welded or joined with a coupler. In other embodiments, the wire ends may not be joined.

FIG. 14A shows a two piece assembly where the rear portion **39** is fabricated in one piece, and the first side rail **11**, the second side rail **12** and the front portion **20** are fabricated as a

second piece. FIG. 14B shows welds 731 and 732 joining the two pieces to form the wire frames.

Alternately, the frame pieces may be attached by other means such as glue or mechanical sleeve couplers. In some embodiments the end side rails may fit into pockets or channels in the rear portion, or the rear portion may fit into pockets or channels on the ends of the side rails. In other embodiments, each of the rear portion, the front portion, the first side rail, and the second side rail may be fabricated separately and assembled into a frame by welding, gluing, mechanical coupling, or other means. A coupling device typically accepts the ends of two wire members and holds the ends in close proximity, such as through a friction fit between the couples and wire ends. Another type of coupling device permits the wire member to slide relative to each other in order to provide length adjustment.

#### DETAILED DESCRIPTION OF EMBODIMENT - Adjustable wire loop with coupler

This embodiment is similar to the closed wire frame embodiment described above, except that the frame is not welded or glued closed. In this embodiment, the ends of the framing are secured with a coupling device such as a section of tubing. The coupling device is preferably located on or near the rear portion of the front portion in order to minimize contact with merchandising items as the slide rails are moved past the items.

FIG. 15A is a top view of a frame with a coupling device 370 near the rear portion. FIG. 15B is a top view of an embodiment where a coupling device 372 accepts two side rail portions and permits adjustment of length by increasing or decreasing the overlap of the side rail sections.

#### DETAILED DESCRIPTION OF EMBODIMENT- Plastic frame

In one embodiment a frame is fabricated as a single injection molded plastic unit. In this embodiment, the dimensions are typically set for a particular product container size.

In an alternate embodiment, a plastic frame may be assembled from two or more pieces- such as a front and rear portion and side rails, and then glued or otherwise assembled into a frame unit.

In an alternate embodiment, the-left and right rails of a frame are fabricated as separate units and assembled with front and rear adjustable coupling devices at the front bend **710** and the rear bend **720** location to permit wider adjustments.

#### 10 DETAILED DESCRIPTION OF EMBODIMENT - Wire frame with adjustable rear plate

In this embodiment, an adjustable rear plate is provided, so that the rear plate may be adjusted from a maximum width at a rear bend angle of 180 degrees to a narrower width as the bend angle is decreased.

FIG. 16A is an illustration of a frame with a rear pull plate member **390** in a first position.

15 FIG. 16B is an illustration of the frame of FIG. 16A in a second, narrower position.

FIG. 16C-D illustrate one method of attaching a rear plate member **390** to the side rails **11** and **12** by providing receiving channels **391** and **392** on the rear plate so that wire ends of the side rails inserted into the receiving elements. The rear plate member is then bent upwards.

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#### DETAILED DESCRIPTION OF EMBODIMENT - Wire frame in cardboard display box

In this embodiment, one or more rows of merchandise items are displayed in cartons such as cardboard boxes. The wire frame may slide on the bottom of a carton **820** as shown in FIG. 17D which is a display carton with a cut out front bottom portion and with the top portion



removed. The front of the carton is typically either removed as shown in FIG. 17D or may be slotted to accept the side rails as described in the embodiment below.

On way to position the wire frame relative to the merchandise items is to follow a sequence such as that described in FIGs. 17A to 17D. In one such sequence, the carton is

5 inverted and cut along the sides as shown in FIG. 17A. In FIG. 17B, the bottom portion **820** of the carton is temporarily removed from the top portion **810**, and frame elements **8** are positioned over each row of merchandise items **830**. The front portion **822** of the bottom of the carton **820** is removed as shown in FIG. 17C, and the bottom portion is placed back over the merchandise items. The carton is reinverted as shown in FIG. 17D, and the top portion **810** is removed. At  
10 this point, a frame **8** may be used to pull a row of merchandise items **830** toward the front of the carton.

DETAILED DESCRIPTION OF EMBODIMENT - Wire rack in combination with a carton display.

15 In this embodiment products are displayed in cartons similar to the boxes of FIGs 17A-17D. The front portion of the display carton bottoms may be slotted to accept the side rails of the wire frame, so that the wire frame may slide unobstructed on the bottom of the display carton.

The display box or display carton embodiments illustrate the use of the invention on various display surfaces. Examples of display surfaces include merchandise directly on display  
20 shelves and the bottom portions of display boxes or cartons, whether those boxes or cartons rest on display shelves or other supports such as a stack of other boxes.

DETAILED DESCRIPTION OF EMBODIMENT - Pull frame with adjustable bend couplers

FIG. 18A is a front perspective view of a pull device with adjustable bend couplers **395**.

FIG. 18B, which is a perspective view of an adjustable bend couple, shows a receiving socket **396** for an upturned end of a side rail **11**. This embodiment is an example of other methods of manufacturing and assembling a pull frame with adjustable width. In this example, the adjustable bend couplers **395** are relatively rigid, but may be bent to a desired angle.

#### DETAILED DESCRIPTION OF EMBODIMENT - Pull frame with front stop

FIG. 19 is a front perspective view of an embodiment with a multiple row front stop device **740**. In one embodiment, the multiple row front stop device may include side extensions **741** and **742** which can be inserted between rows of merchandise. In other embodiments, the multiple row front stop device **740** may not include side extensions. In this example, then combined weight of the containers behind the multiple row front stop device acts to prevent a container from one row from being inadvertently or accidentally pulled off of the display shelf.

FIG. 20A is a front perspective view of an embodiment with snap on front stop devices **750** which clip to the front portion of a display shelf. FIG. 20B is a side view of a display shelf and front stop device. In this example, the front stop device **750** acts to prevent an item from being inadvertently pulled from the shelf. In addition to preventing accidental removal of an item from the shelf, these stop devices permit a one-handed alignment of display rows. In this example, a clerk may grasp the pull frame and pull the frame forward without stopping the items with a second hand.

FIG. 20C is a front perspective view of a front stop device **762** which clips to the front portion of a Lozier or Madix display shelf. The front stop includes a display area **764** for

attaching price labels, a pull slot **766**, and an elastic anchor slot **768**. This example of a front stop works with several display alignment techniques including the wire pull frame **8** as shown; a pull slide as shown in FIG. 20D, and elastic pull devices. In some embodiments, such as the elastic pull devices, a similar stop may be inserted in the rear of a display row in order to provide  
5 a rear elastic anchor.

FIG 25A is a front perspective view of an alternative embodiment of single or multiple row stop devices. In this embodiment, a front stop holder **793** is secured to the lip **52** of a display shelf **50**. FIG 25B is a front perspective detailed view of a front stop holder. FIG 25C is a side view of the holder secured to the lip of a display shelf. A pull frame, as illustrated by narrow  
10 frame **8b** or wide frame **8a**, may slide over the front stop holder **793** so that the first side rail slides on one side of the holder, and the second side rail slides on the other side of the holder. The holder may include a pull strip slot **766** which permits a pull member **797** to slide through the slot. A plurality of holders **793** may secure a stop bar **792** to create a front stop assembly **790** which serves multiple display rows. In other embodiments, one or more holders **793** may be  
15 used without a stop bar to provide a stop for a single row of items. In this example, the front stop holder includes a price label surface **795**, a rear member **794**, a lip retention means such as a screw **799**, and a bottom **796**. When the device is produced from plastic and secured to the shelf lip, the rear member is flexed toward the front price label surface thereby creating a spring force on the plastic acts against the screw and tends to keep the connection with the display shelf lip  
20 tight. In this example, the stop bar **792** snaps into the stop bar retention means **798**. The rod size is typically 1/8 to 1/4 inch in diameter, as appropriate for the items being displayed. In this example, the front stop holders may be extruded and cut to a desired width. Post processing,

such as providing the pull strip slot may be performed. The stop bar may also be extruded and cut to a desired length. In this example, the front stop holders are placed on about 2 foot centers, and 4 foot sections of rod are used for the stop bar. The ends of the stop bar preferably are placed in a stop bar retention means.

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#### DETAILED DESCRIPTION OF EMBODIMENT - Pull frame with container support

FIG. 21A-F show an embodiment with a container support **420** and a pull device **70**. In this example, the pull device has a generally rectangular front pull shape. In other examples, other shapes of pull frames may be used. The container support **420** holds the containers **96** slightly above the display shelf **50**, so that a pull device may be inserted between the containers **96** and the shelf. In this manner, the pull devices may be used for product alignment without requiring any extra display shelf width. In many of the examples above, the pull frame was designed to fit under the rounded edges of containers. In this embodiment, a pull frame may be used with rectangular shaped containers and other container shapes without requiring that the container have a rounded bottom portion.

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In one embodiment, the container support is cardboard, and excess length of the cardboard support is bent around the rear portion of the display shelf. The bent rear portion of the container support **422** helps to hold the cardboard in place. In other examples, the container support may be other materials such as metal or plastic. In other examples the container support may be affixed to the display shelf with magnets or adhesive.

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FIGs 21C and 21E show a row of containers that are not aligned to the front of the shelf. FIGs 21D and 21F illustrate a pull device **70** used to align the containers toward the front of the

display shelf.

In one example, the pull frame has a thickness of about 1/8 inch, and the container supports are slightly more than 1/8 inch thick.

FIG. 23 shows an example of a wire frame 8 used with the container support.

5        The combination of container support and pull frame can work for both small and large items of various shapes. The system is useful for the large number of box containers in a typical store.

#### DETAILED DESCRIPTION OF EMBODIMENT - Adjustable length rectangular pull frame

10        FIG. 22A-D show a rectangular pull frame 70 which includes a rear portion 76, a first side 79, a second side 77, and a front portion 78. In one example, the rectangular frame is fabricated as a simple loop in one plane, and then the front portion may be bent upwards to form a bent up front portion 72 which serves as a pull handle. The rear portion is then bent up to form a bent up rear portion 74 which serves as a pusher element. The length of the frame may be set at  
15 a desired shelf depth by varying the location of either the front or rear bend. Typically the rear bend would be used for length adjustment as illustrated by FIGs 22B-22D which progressively show more of the frame upturned in the rear in order to shorten the length of the sides. This pull frame may be used with container supports as described in the embodiment above, and can be used to fit under rounded bottom edge containers. In other embodiments, the rear portion may be  
20 bent upwards and the front portion may remain flat and serve as a low profile pull handle.